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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/725,379 | 12/03/2003 | Satoru Tobita | H64-163096M/MNN | 3101 |
| 21254 | 7590 | 07/12/2005 | EXAMINER | |
| MCGINN & GIBB, PLLC 8321 OLD COURTHOUSE ROAD SUITE 200 VIENNA, VA 22182-3817 | | | DICT, RACHEL S | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2853 | |

DATE MAILED: 07/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/725,379

Applicant(s)

TOBITA ET AL.

Examiner

Rachel Dicht

Art Unit

2853

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 March 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6, 7, 11-14, 16, 17 and 21 is/are rejected.
- 7) ☐ Claim(s) 9, 10, 19, and 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>12/3/2003</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:
 - Piezoelectric element group 15 (page 9 line 2) and ink flow passage board 22 (page 9 line 3) not located in Fig. 2; and
 - Pressure generating chamber mislabeled as 81 (page 9, line 16).Appropriate correction is required.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, 3, 4, 11, 12, 13, 14, and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Suzuki et al (US Pat. No. 5,710,584).

In regard to:

Claims 1 and 11:

Suzuki et al. teaches an inkjet recording head comprising: a nozzle plate (2, fig. 1 and 5) having nozzles (1, Fig. 1) for discharging ink droplets arranged in a row (Fig. 1); a plurality of pressure generating chambers (9, fig. 5) communicating to the nozzles, the plurality of pressure generating chambers including a first pressure generating chamber and a second pressure generating

chamber; a diaphragm (4e, Fig 5) formed on one face of the pressure generating chamber; a common ink chamber (refer to column 3 lines 66-67 to column 4 line 1) for supplying the ink via an ink supply passage (12, Fig. 1) to the plurality of pressure generating chambers; and a piezoelectric element (6, fig. 5) for displacing the diaphragm; wherein the first pressure generating chamber is disposed on one side of the nozzles arranged in the row, and a second pressure generating chamber is disposed on the other side; and the first and second pressure generating chambers are opposed to each other across the nozzles arranged in the row so that the central lines of the first and second pressure generating chambers are almost coincident (refer to Fig. 5).

Claims 2 and 12:

Suzuki et al. teaches an inkjet recording head wherein the central line between the adjacent nozzles and the central line between the first and second pressure generating chambers are almost coincident.

Claims 3 and 13:

Suzuki et al. teaches an inkjet recording head further comprising: a communication flow passage leading from the pressure generating chamber to the nozzles; wherein the communication flow passage is narrower (refer to space above nozzle 1, Fig. 6) than the width of the pressure chamber (9, Fig. 6).

Claims 4 and 14:

Suzuki et al. teaches an inkjet recording head wherein a part of the communication flow passage (12, Fig. 1) is located outside a side wall face of the pressure generating chamber (9, Fig. 5)(refer to column 3 lines 47-58).

Claim 21:

Suzuki et al. teaches a recording head comprising a nozzle plate (2, Fig. 1) having nozzles (1, Fig. 1) for discharging ink droplets arranged in a row (refer to Fig. 1); a plurality of pressure generating chambers (9, Fig. 5) communicating to the nozzles, the plurality of pressure generating chambers including a first pressure generating chamber and a second pressure generating chamber; a diaphragm (42, Fig. 5) formed on one face of the pressure generating chamber; and a piezoelectric element (6, Fig. 5) for displacing the diaphragm; wherein the first pressure generating chamber is disposed on one side of the nozzles arranged in the row, and a second pressure generating chamber is disposed on the other side; and the first and second pressure generating chambers are opposed to each other across the nozzles arranged in the row so that the ventral lines of the first and second pressure generating chambers are almost coincident.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 6, 7, 16, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. (US Pat. No. 5,710,584) in view of Miura et al. (US Pat. No. 5,604,522).

In regard to:

Claims 6 and 16:

The device of Suzuki et al. DIFFERS from claims 6 and 16 in that it fails to teach an inkjet recording head wherein the piezoelectric element has a piezoelectric material and an electrically conductive material laminated alternately; and on end of the piezoelectric element is fixed to at least one base board having electrical conductivity.

However, Miura et al. teaches an inkjet recording head wherein the piezoelectric element (1, Fig. 4) has a piezoelectric material (2, Fig. 4) and an electrically conductive material (3a and 3b, Fig. 4) laminated alternately; and on end of the piezoelectric element is fixed to at least one base board (5, Fig. 4) having electrical conductivity (refer to column 5 lines 6-17). Miura et al. teaches

that such structure gives a higher pushing pressure and large displacement with low voltage applied (refer to column 5 lines 17-20).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Suzuki et al. to include a piezoelectric element having a piezoelectric material and an electrically conductive material laminated alternately as taught by Miura et al. for the purpose of creating a higher pushing pressure and good ink displacement.

Claim 7 and 17:

The device of Suzuki et al. DIFFERS from claims 7 and 17 in that it fails to teach an inkjet recording head wherein the piezoelectric element is fixed to the base board and then divided like a comb.

However, Miura et al. teaches an inkjet recording head wherein the piezoelectric element (1, Fig. 4) is fixed to the base board (5, Fig. 4) and then divided like a comb (refer to Fig. 4).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Suzuki et al. to incorporate a piezoelectric element that is divided like a comb as taught by Miura et al. for the purpose of creating a higher pushing pressure.

5. Claims 5, 8, 15, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. (US Pat. No. 5,710,584) in view of Hashizume et al. (US Pat. No. 6,089,701).

In regard to:

Claims 5 and 15:

The device of Suzuki et al. DIFFERS from claims 5 and 15 in that it fails to teach an ink jet recording head wherein C_p is chosen to be about double N_p , where the distance between the central lines of the first and second pressure generating chambers is C_p and the distance between the nozzles is N_p .

However, Hashizume et al. teaches an ink jet recording head wherein C_p is chosen to be about double N_p , where the distance between the central lines of the first and second pressure generating chambers is C_p and the distance between the nozzles is N_p (refer to Fig. 1, N_p is the distance between pressure generating chambers 3 located on both sides of substrate and C_p is the distance between nozzles in one column of nozzles 16).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Suzuki et al. to modify the distances between the pressure chambers and nozzles as taught by Hashizume et al. for the purpose of ensuring quality printed images.

Claims 8 and 18:

The device of Suzuki et al. DIFFERS from claims 8 and 18 in that it fails to teach an ink jet recording head wherein the pressure generating chamber is formed of silicon by etching. Suzuki et al. teaches instead a laminated structure for the chambers.

However, Hashizume et al. teaches an ink jet recording head wherein the pressure generating chamber is formed of silicon by etching (refer to column 3 lines 55-57).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Suzuki et al. to include a pressure generating chamber formed by etching as taught by Hashizume et al. for the purpose of providing a functionally equivalent means of forming the chambers. Applicant is reminded that no patentable weight is given to methods of manufacture in claims drawn to structure.

Allowable Subject Matter

6. Claims 9, 10, 19, and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

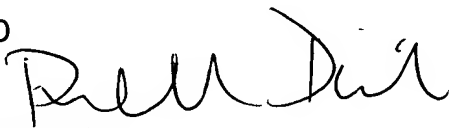
Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rachel Dicht whose telephone number is 571-272-8544. The examiner can normally be reached on 7:00 am - 3:30 pm Monday through Friday.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on 571-272-2149. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RSD



July 6, 2005



Stephen D. Meier
Primary Examiner